

RECEIVED
CENTRAL FAX CENTER

SEP 04 2007

Claims: Claims 1-31 are pending in this application. Claims 1-3, 5-9, 14, 27, and 31 are amended in this office action response. Additions to claims are indicated by underlining. Deletions to claims are indicated by strikethroughs or double brackets. No claims are canceled in this office action response. With entry of these amendments, claims 1-31 will be pending in this application.

CLAIM LISTING:

1. (currently amended) A method, comprising:

~~partitioning a group of pixels, corresponding to a group of values, into a first plurality of columns including the pixels forming the group of pixels, with individual of the first plurality of columns including a second plurality of columns and with each of the ones of the first plurality of columns including a plurality of rows of the pixels;~~

transferring a first plurality values, corresponding to a first one of a plurality of rows of pixels in a first one of a plurality of segments of pixels included in a group of pixels, over a first bus to a first processing device;

halftoning a the first plurality of values, ~~corresponding to a first one of the plurality of rows in a first one of the first plurality of columns,~~ to form a first plurality of error terms using the first processing device; and

transferring at least one of the first plurality of error terms over a second bus to a second processing device, with the second bus having a lower maximum transfer rate than the first bus; and

halftoning, using the at least one of the first plurality of error terms, on a second plurality of values corresponding to a second one of the plurality of rows in a second one of the first plurality of segments ~~columns,~~ ~~after completion of the halftoning on the first plurality of values,~~ to form a second plurality of error terms using the second processing device.

2. (currently amended) The method as recited in claim 1, wherein:
the first one of the first plurality of segments ~~columns~~ and the
second one of the first plurality of segments ~~columns~~ include equal numbers of
the pixels.

3. (currently amended) The method as recited in claim 1 ~~[[2]]~~,
wherein:

the first one of the first plurality of segments ~~columns~~ exists
adjacent to the second one of the first plurality of segments ~~columns~~ within an
image formed by the first plurality of segments ~~columns~~; and

a boundary at an interface between the first one of the first plurality
of ~~columns~~ segments and the second one of the first plurality of segments
~~columns~~ forms a substantially straight line within the image~~[[;]]~~.

4. (original) The method as recited in claim 3, wherein:
the boundary exists substantially perpendicular to the plurality of
rows of the pixels.

5. (currently amended) The method as recited in claim 1 ~~[[4]]~~,
wherein:

the first one of the plurality of rows and the second one of the
plurality of rows exist in alignment within the image.

6. (currently amended) The method as recited in claim 1 ~~[[5]]~~,
wherein:

the halftoning includes error diffusion halftoning.

7. (currently amended) The method as recited in claim 1 ~~[[6]]~~,
wherein:

halftoning of ones of the plurality of rows in the first one of the first
plurality of segments ~~columns~~, other than the first one of the plurality of rows,
occurs contemporaneously with halftoning of ones of the plurality of rows in the

second one of the first plurality of segments columns, other than the second one of the plurality of rows.

8. (currently amended) The method as recited in claim 1, wherein:
the first one of the first plurality of segments columns includes ones of the pixels included in the second one of the first plurality of segments columns.

9. (currently amended) An apparatus, comprising:
a first processing device to perform halftoning on a first set of values received over a first bus and corresponding to a first set of pixels ~~forming a first column, including a first plurality of columns, with the first column included in a second plurality of columns formed from partitioning a group of pixels forming an image and;~~

a second processing device to perform halftoning on a second set of values corresponding to a second set of pixels ~~forming a second column included in the second plurality of columns,~~ with ones of the first set of pixels located adjacent to the second set of pixels and with ones of the second set of pixels located adjacent to the first set of pixels; and

a second bus arranged for transferring a third set of values, from the halftoning of ones of the first set of values corresponding to the ones of the first set of pixels, to the second processing device and for transferring a fourth set of values, from the halftoning of ones of second set of values corresponding to the ones of the second set of pixels, to the first processing device, with the second bus having a lower maximum transfer rate than the first bus.

10. (original) The apparatus as recited in claim 9, wherein:
the halftoning includes error diffusion halftoning.

11. (original) The apparatus as recited in claim 10, wherein:
the third set of values includes error terms generated from the error diffusion halftoning of the ones of the first set of pixels; and
the fourth set of values includes error terms generated from the

error diffusion halftoning of the ones of the second set of pixels.

12. (original) The apparatus as recited in claim 11, wherein:
the first set of pixels and the second set of pixels each include
equal numbers of the pixels, with the first set of pixels and the second set of
pixels included within an image; and
with the ones of the first set of pixels adjacent to the ones of the
second set of pixels within the image.

13. (original) The apparatus as recited in claim 12, wherein:
a boundary at an interface between the ones of the first set of
pixels and the ones of the second set of pixels forms a substantially straight line
within the image.

14. (currently amended) The apparatus as recited in claim 13,
wherein:
the first set of pixels includes a spatial arrangement into a first
plurality of rows forming a first segment of the image; and
the second set of pixels includes a spatial arrangement into a
second plurality of rows forming a second segment of the image, with the ones of
the first set of pixels forming the a first column adjacent to the a second column
formed from the ones of the second set of pixels, with the boundary at the
interface between the first column and the second column.

15. (previously presented) The apparatus as recited in claim 14,
wherein:
the first plurality of rows includes a first row located on a first edge
of the first column and the second plurality of rows includes a second row located
on a second edge of the second column, with the first row aligned with the
second row in the image; and
the first processing device includes a configuration to complete the
error diffusion halftoning on the first row before the second processing device

begins the error diffusion halftoning on the second row.

16. (previously presented) The apparatus as recited in claim 15, wherein:

the first plurality of rows includes a third row located adjacent to the first row in the first column;

the second plurality of rows includes a fourth row located adjacent to the second row in the second column;

the second processing device includes a configuration to begin the error diffusion halftoning on the second row before the first processing device completes the error diffusion halftoning on the third row; and

the first processing device includes a configuration to complete the error diffusion halftoning on the third row before the second processing device begins the error diffusion halftoning on the fourth row.

17. (original) The apparatus as recited in claim 16, wherein:

the first processing device includes a first halftone processor and the second processing device includes a second halftone processor.

18. (original) The apparatus as recited in claim 9, wherein:

the halftoning includes error diffusion halftoning.

19. (original) The apparatus as recited in claim 18 further comprising:

a third processing device to perform halftoning on a fifth set of values corresponding to a third set of pixels; and

a fourth processing device to perform halftoning on a sixth set of values corresponding to a fourth set of pixels, with ones of the third set of pixels located adjacent to the fourth set of pixels, with ones of the fourth set of pixels located adjacent to the third set of pixels, and with the bus coupled to the third processing device and the fourth processing device for transferring a seventh set of values, from the halftoning of the ones of the third set of pixels to the fourth

processing device, and for transferring an eighth set of values, from the halftoning of the ones of the fourth set of pixels, to the third processing device.

20. (original) The apparatus as recited in claim 19 wherein:

the third set of values includes error terms generated from the error diffusion halftoning of the ones of the first set of pixels;

the fourth set of values includes error terms generated from the error diffusion halftoning of the ones of the second set of pixels;

the seventh set of values includes error terms generated from the error diffusion halftoning of the ones of the third set of pixels; and

the eighth set of values includes error terms generated from the error diffusion halftoning of the ones of the fourth set of pixels.

21. (original) The apparatus as recited in claim 20, wherein:

the first set of pixels, the second set of pixels, the third set of pixels, and the fourth set of pixels each include equal numbers of pixels, with the first set of pixels, the second set of pixels, the third set of pixels, and the fourth set of pixels included within an image.

22. (original) The apparatus as recited in claim 21, wherein:

a first boundary formed at a first interface between the ones of the first set of pixels and the ones of the second set of pixels forms a substantially straight line within the image; and

a second boundary formed at a second interface between the ones of the third set of pixels and the ones of the fourth set of pixels forms the substantially straight line within the image.

23. (previously presented) The apparatus as recited in claim 22, wherein:

the first set of pixels includes a spatial arrangement into a first plurality of rows forming the first column;

the second set of pixels includes a spatial arrangement into a

second plurality of rows forming the second column, with the ones of the first set of pixels forming the first column adjacent to the second column formed from the ones of the second set of pixels, with the first boundary at the interface between the first column and the second column;

the third set of pixels includes a spatial arrangement into a third plurality of rows forming a third column; and

the fourth set of pixels includes a spatial arrangement into a fourth plurality of rows forming a fourth column, with the ones of the third set of pixels forming the third column adjacent to the fourth column formed from the ones of the fourth set of pixels, with the second boundary at the interface between the third column and the fourth column.

24. (previously presented) The apparatus as recited in claim 23, wherein:

the first plurality of rows includes a first row located on a first edge of the first column, the second plurality of rows includes a second row located on a second edge of the second column, the third plurality of rows includes a third row located on a third edge of the third column, the fourth plurality of rows includes a fourth row located on a fourth edge of the fourth column, with the first row, the second row, the second row, the third row, and the fourth row aligned within the image;

the first processing device includes a configuration to complete the error diffusion halftoning on the first row before the second processing device begins the error diffusion halftoning on the second row;

the second processing device includes a configuration to complete the error diffusion halftoning on the second row before the third processing device begins the error diffusion halftoning on the third row; and

the third processing device includes a configuration to complete the error diffusion halftoning on the third row before the fourth processing device begins the error diffusion halftoning on the fourth row.

25. (original) The apparatus as recited in claim 11, wherein:

the first set of pixels includes a third set of pixels and the second set of pixels includes the third set of pixels, with the ones of the first set of pixels located adjacent to the third set of pixels and the ones of the second set of pixels located adjacent to the third set of pixels.

26. (original) The apparatus as recited in claim 25, wherein:

the first processing device includes a configuration to transfer a fifth set of values, corresponding to a first subset of pixels of the third set of pixels included within the first set of pixels, to the second processing device using the bus;

the second processing device includes a configuration to transfer a sixth set of values, corresponding to a second subset of pixels of third set of pixels included within the second set of pixels, to the first processing device using the bus;

the first processing device includes a configuration to perform the error diffusion halftoning on the sixth set of values; and

the second processing device includes a configuration to perform the error diffusion halftoning on the fifth set of values.

27. (currently amended) An imaging device, comprising:

an interface arranged to receive data, corresponding to an image, from a computer;

a processor configured to generate color values, corresponding to pixels forming the image, using the data received from the interface;

a processing system arranged to receive the color values and including a first processing device to receive, over a first bus, a first set of values, included in the color values, corresponding to a first set of pixels and to perform halftoning on a ~~the~~ first set of values, included in the color values, corresponding to a first set of pixels forming a first column, with the first column and included as a first one of a plurality of columns formed from partitioning the pixels forming

~~the image into the plurality of columns, to form a first set of halftone values, a second processing device to perform halftoning on a second set of values, included in the color values, corresponding to a second set of pixels forming a second column, with the second column included as a second one of the plurality of columns to form a second set of halftone values, with ones of the first set of pixels located adjacent to the second set of pixels and with ones of the second set of pixels located adjacent to the first set of pixels and a second bus coupling the first processing device and the second processing device for transferring a third set of values from the halftoning of the ones of the first set of pixels to the second processing device and for transferring a fourth set of values from the halftoning of the ones of the second set of pixels to the first processing device, with the second bus having a lower maximum transfer rate than the first bus;~~

an image forming mechanism configured to form the image using the first set of halftone values and the second set of halftone values; and

memory to store the color values, the first set of halftone values, and the second set of halftone values.

28. (original) The imaging device as recited in claim 27, wherein:
the halftoning includes error diffusion halftoning;

the third set of values includes error terms generated from the error diffusion halftoning of the ones of the first set of pixels;

the fourth set of values includes error terms generated from the error diffusion halftoning of the ones of the second set of pixels;

the first set of pixels and the second set of pixels each include equal numbers of the pixels, with the first set of pixels and the second set of pixels; and with the ones of the first set of pixels adjacent to the ones of the second set of pixels within the image; and

a boundary at an interface between the ones of the first set of pixels and the ones of the second set of pixels forms a substantially straight line within the image.

29. (original) An inkjet printer for forming an image on media using ink, comprising:

- a first printhead positioned to eject the ink onto the media for a first portion of the image;

- a first printhead driver configured to generate a first set of electrical signals, used by the first printhead for the ejection of the ink, from a first set of halftone values;

- a first halftone processor configured to perform error diffusion halftoning on a first set of values corresponding to a first set of pixels included in the first portion of the image to form the first set of halftone values;

- a first memory to store the first set of values and the first set of halftone values;

- a first memory controller configured to transfer the first set of values and the first set of halftone values to and from the first memory and the first halftone processor;

- a first processor coupled to the first memory controller and the first halftone processor;

- a second printhead positioned to eject the ink onto the media for a second portion of the image;

- a second printhead driver configured to generate a second set of electrical signals, used by the second printhead for the ejection of the ink, from a second set of halftone values;

- a second halftone processor configured to perform error diffusion halftoning on a second set of values corresponding to a second set of pixels included in the second portion of the image to form the second set of halftone values;

- a second memory to store the second set of values and the second set of halftone values;

- a second memory controller configured to transfer the second set of values and the second set of halftone values to and from the second memory and the second halftone processor;

a second processor coupled to the second memory controller and the second halftone processor;

a third printhead positioned to eject the ink onto the media for a third portion of the image;

a third printhead driver configured to generate a third set of electrical signals, used by the third printhead for the ejection of the ink, from a third set of halftone values;

a third halftone processor configured to perform error diffusion halftoning on a third set of values corresponding to a third set of pixels included in the third portion of the image to form the third set of halftone values;

a third memory to store the third set of values and the third set of halftone values;

a third memory controller configured to transfer the third set of values and the third set of halftone values to and from the third memory and the third halftone processor;

a third processor coupled to the third memory controller and the third halftone processor;

a fourth printhead positioned to eject the ink onto the media for a fourth portion of the image;

a fourth printhead driver configured to generate a fourth set of electrical signals, used by the fourth printhead for the ejection of the ink, from a fourth set of halftone values;

a fourth halftone processor configured to perform error diffusion halftoning on a fourth set of values corresponding to a fourth set of pixels included in the fourth portion of the image to form the fourth set of halftone values;

a fourth memory to store the fourth set of values and the fourth set of halftone values;

a fourth memory controller configured to transfer the fourth set of values and the fourth set of halftone values to and from the fourth memory and the fourth halftone processor; and

a fourth processor coupled to the fourth memory controller and the fourth halftone processor;

a bus arranged to transfer error terms from performing the error diffusion halftoning between the first processor and the second processor, between the second processor and the third processor, and the third processor and the fourth processor.

30. (original) The inkjet printer as recited in claim 29, wherein:
the first set of pixels and the second set of pixels include common ones of the pixels;
the second set pixels and the third set of the pixels include common ones of the pixels; and
the third set of pixels and the fourth set of the pixels include common ones of the pixels.

31. (currently amended) A halftoning apparatus, comprising:
first means for halftoning on a first set of values received over a first bus and corresponding to a first set of pixels partitioned from a group of pixels forming an image ~~to form a first column, with the first column included as a first one of a plurality of columns formed from partitioning the group of pixels;~~
second means for halftoning on a second set of values corresponding to a second set of pixels partitioned from the group of pixels forming the image ~~to form a second column, with the second column included as a second one of the plurality of columns and~~ with ones of the first set of pixels located adjacent to the second set of pixels and with ones of the second set of pixels located adjacent to the first set of pixels; and
~~means for transferring a second bus~~ arranged to transfer a third set of values, from the halftoning of ones of the first set of values corresponding to the ones of the first set of pixels, to the second means for halftoning and for transferring a fourth set of values, from the halftoning of ones of second set of values corresponding to the ones of the second set of pixels, to the first means

for halftoning, with the second bus having a lower maximum transfer rate than the first bus.